

REMARKS

The claims are directed to a method and apparatus for implementing common rate control in a reverse link channel in a CDMA network. Common rate control is one technique for controlling the data transmission rate of mobile stations on the reverse link. A base station periodically (e.g., once per frame) estimates the reverse link load and sends rate control commands to the mobile stations based on the current load at the base station. Typically, the base stations sends a "1" to instruct the mobile stations to increase their data rate and sends a "0" to instruct the mobile terminals to decrease their data rate. With common rate control, a single rate control command is sent to a group of mobile stations. Thus, all mobile stations in the group will increase or decrease their data rates in unison with one another, resulting in large fluctuations in load at the base station.

The present invention avoids large fluctuations in load at the base station by using a probabilistic rate change mechanism. The rate control commands can be viewed as load indications. The mobile stations filter the rate control commands (load indications) to generate a load tracking value. The load tracking value is then used to determine a rate change probability. The rate change probability computed at each mobile station determines the probability that it will change its data transmission rate in the current evaluation period responsive to the rate control command/load indication. For example, if the rate change probability is .66, then two-thirds of the mobile stations will increase their data rate responsive to a "1." As a result, some of the mobile stations will change rates while other mobile stations will continue to transmit at their current rate.

Independent claims 1 and 23 have been rejected under 35 U.S.C. § 102 in view of the patent to Cheng et al., U.S. 6,999,425 (Cheng). Cheng describes a method implemented at a base station to set a maximum rate limit for the reverse link channel. In Cheng, the base station computes the reverse link load and uses the reverse link load to set the rate limit for the mobile

stations. For example, if the reverse link load is 100% of the maximum load, the rate limit is equal to 9.6% (see Fig. 3). If the reverse link load is 50% of the maximum load, the rate limit is set to 76.8. Presumably, the base station in Cheng sends the rate limit to the mobile stations, but does not send rate control commands/load indications to the mobile station. On the contrary, Cheng suggests that the mobile stations autonomously change their rate up to the rate limit set by the base station.

The Examiner maintains that Cheng discloses the claimed invention because the base station selects a rate limit from a predetermined set of rates that have an equal probability of being selected. This reasoning is demonstrates a complete failure by the Examiner to appreciate the claimed invention and the prior art.

Claim 1 is directed to a method of adjusting the transmission rate of a mobile station and includes four elements. The first element is "receiving periodic load indications from a base station." As noted above, there is no indication that the base station in Cheng transmits a periodic load indication to the mobile stations. Instead, Cheng uses the reverse link load to compute a maximum rate limit for the mobile stations. Claim 1 further recites "calculating a load tracking value based on two or more periodic load indications," and "determining a rate change probability as a function of the load tracking value." There is no mention in Cheng of a "load tracking value" or a "rate change probability." Finally, claim 1 recites "selectively changing the transmission rate of the mobile station responsive to a current rate control command based on the rate change probability." Cheng does not disclose selectively changing data rate based on a rate change probability.

A rejection under 35 U.S.C. §102(b) requires the presence of every limitation. Cheng discloses none of the elements of claim 1. Accordingly, claim 1 does not be anticipated by Cheng.

Claim 23 is directed to a mobile station that practices the method set forth in claim 1. Claim 30 recites "a receiver for receiving periodic load indications from a base station," and "a controller to vary the data transmission rate of the mobile station." Claim 23 further recites that the controller is configured to "calculate a load tracking value based on two or more periodic load indications," "determine a rate change probability as a function of the load tracking value," and "selectively change the data transmission rate of the mobile station responsive to a current rate control command based on the rate change probability." As discussed above, Cheng does not disclose "receiving periodic load indications from a base station." Further, Cheng does not disclose the claimed functions of the controller. Specifically, Cheng does not disclose calculating a load tracking value, determining a rate change probability based on the load tracking value, or selectively changing the data transmission rate as set forth in claim 23. Consequently, Cheng does not anticipate claim 23.

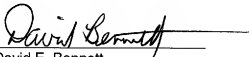
The patent to Soliman, U.S. Patent No. 6,490,460, discloses a method and apparatus for dynamically adjusting a power control loop for either forward link or reverse link communications. Applicant notes that Soliman relates to a method of power control, as compared to the claimed invention, which relates to a method of rate control. Soliman is cited only against claims 8-11 and 30-33. There is no indication by the Examiner that Soliman discloses the elements of independent claims 1 and 23.

The patent to Black, U.S. Patent No. 6,397,070, discloses a method and apparatus for estimating reverse link loading in a wireless communication system. The background of the invention suggests that the reverse link loading may be used for access control; that is, to admit or deny access to the system based on the reverse link load. There is no discussion of rate control. Further, Black does not disclose the calculating, determining, and selecting operations set forth in independent claims 1 and 23.

Based on the foregoing, it is believed that the claimed invention is patentable over the prior art made of record and withdrawal of the rejections under 35 U.S.C. § 102 and § 103 is respectfully solicited.

Respectfully submitted,

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A handwritten signature in dark ink, appearing to read "David E. Bennett", is written over a horizontal line.

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